

Notice of Allowability

Application No.

09/541,159

Examiner

Kim-Kwok CHU

Applicant(s)

LAM ET AL.

Art Unit

2653

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment filed on 6/22/04.
2. ☒ The allowed claim(s) is/are 1, 8, 9 and 12-28 which are renumbered as 1-20 respectively.
3. ☒ The drawings filed on 1/02/04 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date 10.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|---|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

Allowable Subject Matter

1. Claims 1, 8, 9 and 12-28 are allowable over the prior art of record.

2. The following is an Examiner's Statement of Reasons for Allowance based on Applicant's Amendment filed on June 22, 2004.

As in claim 1, the prior art of record fails to teach or fairly suggest a method of generating a seek time for a physical disk drive including multiple logical volume having the following steps:

(a) generating a seek time for disk head movement between the first and second addresses by linearly interpolating the array of actual seek times based upon the first and second addresses; and

(b) the interpolating being based on a Ratio Theorem analysis using a center location of each segment as the reference location for disk seek operation between different logical volumes.

As in claim 9, the prior art of record fails to teach or fairly suggest that the seek time determination having the following steps

(a) determining actual seek times for seek operations between the segments by:

(i) assigning a predetermined seek time for each seek operation between two segment boundaries;

(ii) calculating an intrasegment seek time based upon the predetermined seek times; and

(iii) placing the predetermined seek time in a two-dimensional array with the rows and columns defined by the segment boundaries.

As in claims 23 and 26, the prior art of record fails to teach or fairly suggest that a steps:

(a) dividing the physical disk into a plurality of fixed sized segments characterized by boundaries independently of the logical volume configuration on the physical disk drive;

(b) determining seek times for seek operations between the segments by assigning empirically derived seek times between two segment boundaries;

(c) accumulating statistics for each access to each logical volume during the time interval;

(d) converting the accumulated statistics into an estimated number of seeks between each pair of logical volumes by weighting the numbers of accesses in each of different predetermined classes;

(e) defining a seek time for each logical volume pair based upon said segment seek times by using the center

locations of each logical volume to interpolate the seek times determined for seek operations between the segments; and

(f) generating a total seek time that is the sum of the seek times for each logical volume pair obtained as a function of the estimated number of seeks and the defined seek time for the logical volume pair.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious over, the prior art of record.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the Issue Fee and, to avoid processing delays, should preferably **accompany** the Issue Fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks Washington, D.C.
20231 Or faxed to:

(703) 872-9306 (for formal communications intended for
entry. Or:

(703) 746-6909, (for informal or draft communications,
please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park
II, 2021 Crystal Drive, Arlington. VA., Sixth Floor
(Receptionist).

Any inquiry of a general nature or relating to the status
of this application should be directed to the Group
receptionist whose telephone number is (703) 305-4700.

Any inquiry concerning this communication or earlier
communications from the examiner should be directed to Kim CHU
whose telephone number is (703) 305-3032 between 9:30 am to
6:00 pm, Monday to Friday.

ke 8/26/04
Kim-Kwok CHU
Examiner AU2653
August 26, 2004

[Signature]
TAN DINH
PRIMARY EXAMINER

(703) 305-3032